

In the claims:

1 - 27. (Canceled)

28. (Currently amended) A pierce nut installation apparatus for installing pierce nuts into a panel, each pierce nut having a bore disposed therethrough, comprising:

a pierce nut installation head having a plunger passage for receiving a pierce nut for installation into the panel;

a plunger reciprocating in said plunger passage having a proximal end driving the pierce nuts through said plunger passage into the panel piercing a slug from the panel thereby forming an opening in the panel and installing the pierce nut into the opening in the panel left by the slug;

said plunger having an axial opening telescopically receiving a slug probe rod resiliently biased toward said proximal end of said plunger and extending beyond said proximal end of said plunger through the bore disposed in said pierce nut thereby ensuring the slug is pierced from the panel wherein said slug probe rod is resiliently biased toward said proximal end by a coil spring coaxial with said slug probe rod or by pneumatic pressure acting on said slug probe rod; and

a slug sensor located beneath the panel for sensing if the slug has been pierced from the panel and has been ejected from said pierce nut installation apparatus.

29. (Previously presented) The apparatus as set forth in claim 28, including a die button disposed beneath said plunger, said die button having an annular opening for receiving the slug pierced from the panel.

30. (Previously presented) The apparatus as set forth in claim 29, wherein said slug sensor is disposed below said proximal end of said plunger.

31. (Previously presented) The apparatus as set forth in claim 30, wherein said slug sensor is located proximate said die button.

32. (Previously presented) The apparatus as set forth in claim 28, wherein said slug sensor comprises an electric current sensor having a signal interrupted by the presence of a slug.

33. (Previously presented) The apparatus as set forth in claim 31, wherein said die button shields said slug sensor from the slug passing through said plunger passage.

34. (Previously presented) The apparatus as set forth in claim 29, wherein said slug sensor is mounted in a tube being coaxially aligned with said die button.

35. (Previously presented) The apparatus as set forth in claim 34, wherein said slug sensor comprises a ring sensor and said ring is coaxially aligned with said die button.

36. (Previously presented) The apparatus as set forth in claim 34, wherein said slug sensor is conductive generating a magnetic field to identify the presence of a slug.

37. (Canceled)

38. (Currently amended) A pierce nut installation tool for installing a pierce nut into a panel, comprising:

an upper installation assembly spaced above a lower installation assembly for receiving the panel therebetween;

said upper installation assembly having a plunger with a proximal end reciprocating toward the panel for driving the pierce nut into the panel and said lower installation assembly having a die button cooperating with said proximal end of said plunger to pierce a slug from the panel into said lower installation assembly thereby forming a hole in the panel and plastically deforming the panel and fastening the pierce nut to the panel;

an ejector interacting with the slug pierced from the panel thereby ejecting the slug from said lower installation assembly, wherein said ejector comprises a slug rod telescopically extending beyond said proximal end of said plunger for forcing the slug pierced from the panel through said lower installation assembly, and wherein said slug rod is resiliently biased toward said proximal end by a coil spring coaxial with said slug rod or by pneumatic pressure acting on said slug rod; and

a sensor disposed at said lower installation assembly for sensing if the slug has been ejected from said lower installation assembly by detecting the presence of the slug being ejected from said lower installation assembly.

39. (Canceled)

40. (Previously presented) The apparatus as set forth in claim 38, wherein said slug sensor comprises a ring sensor through which the slug passes.

41. (Previously presented) The apparatus as set forth in claim 40, wherein said slug sensor is conductive generating a magnetic field to identify the presence of a slug.

42 - 43. (Canceled)

44. (Previously presented) The assembly as set forth in claim 38, wherein said sensor comprises an electromagnetic sensor defining a sensor aperture therein.

45. (Previously presented) The assembly as set forth in claim 38, wherein said sensor signals an alarm when a slug has not been sensed in cooperation with said plunger reciprocating for driving the pierce nut into the panel.

46. (Previously presented) The assembly as set forth in claim 45, wherein said sensor is shielded from contact with said slug passing through said sensor.

47. (Canceled)